# Test Report

**Report No.:** E20230128179401-1

| | |
|---|---|
| Customer: | Lumi United Technology Co., Ltd |
| Address: | Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China |
| Sample Name: | Door and Window Sensor P2 |
| Sample Model: | DW-S02E |
| Receive Sample Date: | Jan.30,2023 |
| Test Date: | Jan.31,2023 ~ Feb.21,2023 |
| Reference Document: | ETSI EN 300 328 V2.2.2 (2019-07) |
| Test Result: | Pass |

Prepared by: *Chen XiaoCong*    Reviewed by: *Jiang Tao*    Approved by: *Zhao Zetian*

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date:    2023-02-25

# Statement

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2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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# TABLE OF CONTENTS

**------------ The following blanks ------------**

**REPORT ISSUED HISTORY**

| Report Version | Report No. | Description | Compile Date |
|:---:|:---:|:---:|:---:|
| 1.0 | E20230128179401-1 | Original Issue | 2023-02-22 |

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## 1.    TEST RESULT SUMMARY

| Test Item | Test mode | Test Requirement | Test Method | Class / Severity | Test Result |
|---|---|---|---|---|---|
| 1. Transmitter Part | | | | | |
| RF Output Power | Mode 1 | EN300 328 V2.2.2/ 4.3.2.2 | EN300 328 V2.2.2/5.4.2.2.1 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.2 | PASS |
| Power Spectral Density | Mode 1 | EN300 328 V2.2.2/4.3.2.3 | EN300 328 V2.2.2/5.4.3.2.1 | Meet requirements: EN300 328 V2.2.2/4.3.2.3 | PASS |
| Duty Cycle, Tx-sequence, Tx-gap | Mode 1 | EN300 328 V2.2.2/4.3.2.4 | EN300 328 V2.2.2/5.4.2.2.1 | Meet requirements: EN300 328 V2.2.2/4.3.2.4 | N/A[1] |
| Medium Utilisation (MU) factor | Mode 1 | EN300 328 V2.2.2/ 4.3.2.5 | EN300 328 V2.2.2/5.4.2.2 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.5 | N/A[2] |
| Adaptivity | Mode 3 | EN300 328 V2.2.2/ 4.3.2.6 | EN300 328 V2.2.2/5.4.6.2.1 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.6 | N/A[1] |
| Occupied Channel Bandwidth | Mode 1 | EN300 328 V2.2.2/ 4.3.2.7 | EN300 328 V2.2.2/5.4.7.2.1 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.7 | PASS |
| Transmitter unwanted emissions in the out-of-band domain | Mode 1 | EN300 328 V2.2.2/ 4.3.2.8 | EN300 328 V2.2.2/5.4.8.2.1 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.8 | PASS |
| Transmitter unwanted emissions in the spurious domain | Mode 1 | EN300 328 V2.2.2/ 4.3.2.9 | EN300 328 V2.2.2/5.4.9.2.2 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.9 | PASS |
| 2. Receiver Part | | | | | |
| Receiver spurious emissions | Mode 2 | EN300 328 V2.2.2/ 4.3.2.10 | EN300 328 V2.2.2/5.4.10.2.2 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.10 | PASS |
| Receiver Blocking | Mode 3 | EN300 328 V2.2.2/ 4.3.2.11 | EN300 328 V2.2.2/5.4.11.2.1 | Meet requirements: EN300 328 V2.2.2/ 4.3.2.11 | PASS |

Note:

1. This item does not apply for equipment with a declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p, but the EUT power is less than 10dBm, so it is not applied.

2. This requirement does not apply for non-FHSS equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for non-FHSS equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

## 2. GENERAL DESCRIPTION OF EUT

### 2.1 APPLICANT INFORMATION

| | |
|---|---|
| Name: | Lumi United Technology Co., Ltd |
| Address: | Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China |

### 2.2 MANUFACTURER

| | |
|---|---|
| Name: | Lumi United Technology Co., Ltd |
| Address: | Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China |

### 2.3 BASIC DESCRIPTION OF EUT

| | |
|---|---|
| Product Name: | Door and Window Sensor P2 |
| Product Model: | DW-S02E |
| Adding Model: | DW-S02D |
| Models Difference: | DW-S02E & DW-S02D are the same on the board, schematic, hardware version, software version, structure and internal photos are same, only the model name is different. |
| Trade Name: | Aqara |
| Power Supply: | DC 3V power supplied by battery |
| Battery Specification: | Model:CR123A<br>Norminal Voltage:3.0Vdc<br>Rated Capacity: 1400mAh |
| Frequency Band: | 2405MHz-2480MHz |
| Modulation Type: | O-QPSK |
| Antenna Specification: | PIFA antenna 1dBi gain (Max.) |
| Sample submitting way: | ■Provided by customer    □Sampling |
| Sample No: | E20230128179401-0001, E20230128179401-0006 |
| Temperature Range: | -10 ℃ ~ 50 ℃ |
| Hardware Version: | X0 |
| Software Version: | 0.0.0.1 |
| Note: | All the tests were performed on the model DW-S02E. |

## 2.4    TEST MODE

Test mode 1:                 Thread fixed transmitting mode

Test mode 2:                 Thread receiving mode

Test mode 3:                 Thread normal mode

## 2.5    FREQUENCY BAND AND THE TEST FREQUENCY

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| **\*11** | **2405** | 12 | 2410 | 13 | 2415 | 14 | 2420 |
| 15 | 2425 | 16 | 2430 | 17 | 2435 | **\*18** | **2440** |
| 19 | 2445 | 20 | 2450 | 21 | 2455 | 22 | 2460 |
| 23 | 2465 | 24 | 2470 | 25 | 2475 | **\*26** | **2480** |

**\*** is the test frequency

## 2.6    DESCRIPTION OF ADAPTIVE EQUIPMENT

| | | | | | |
|---|---|---|---|---|---|
| The type of the equipment | □ FHSS | √ other forms of modulation | □ Non-FHSS | | |
| Adaptive / non-adaptive equipment | √ Non-adaptive Equipment | □ adaptive Equipment without the possibility to switch to a non-adaptive mode | | □ adaptive Equipment which can also operate in a non-adaptive mode | |
| The equipment has an implemented | □ Frame Based equipment | □ Load Based equipment | □ non-LBT based DAA mechanism | √ other | |
| Device Class | □ Wi-Fi | □ Bluetooth Low Energy | □ Bluetooth EDR/BR | □ BT 5.2 | |
| Wi-Fi Channel Bandwidth | □ 20MHz | □ 40MHz | □ 80MHz | □ 160MHz | |
| Antenna Gain | √ Antenna1 1dBi | □ Antenna 2 dBi | □ Antenna 3 dBi | □ Antenna 4 dBi | |
| Beamforming Gain | □ Yes, dBi | √ No | | | |
| Extreme operating conditions | √ Operating temperature range: | √ Min -10℃ | √ Max 50℃ | | |
| Blocking | √ PER | □ The manufacturer may declare alternative performance criteria | | | |
| Geo-location capability supported by the equipment | □ Yes | √ No | | | |

The maximum RF output power is 8.75dBm, so the EUT is Receiver Category 2 equipment.

## 3.  LABORATORY

The tests and measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

| | |
|---|---|
| Add. : | No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China |

| | |
|---|---|
| P.C. : | 518110 |
| Telephone: | 0755-61180008 |
| Fax: | 0755-61180008 |

## 4.  ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

| | |
|---|---|
| **USA** | A2LA(Certificate#:2861.01) |
| **China** | CNAS(L0446) |

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

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|---|---|
| **Canada** | ISED (Company Number: 24897, CAB identifier:CN0069) |
| **USA** | FCC (Registration Number: 759402, Designation Number:CN1198) |

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com


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## 5. MEASUREMENTS UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI EN TR 100 028-1 (i.15) and ETSI EN 100 028-2 (i 8):

| Measurement | | Frequency | Uncertainty |
|---|---|---|---|
| Radiated Emission | Horizontal | 30MHz～1000MHz | 4.3dB |
| | | 1GHz～18GHz | 5.6dB |
| | Vertical | 30MHz～1000MHz | 4.3dB |
| | | 1GHz～18GHz | 5.6dB |

| Measurement | Uncertainty |
|---|---|
| RF frequency | $6.0 \times 10^{-6}$ |
| RF power conducted | 0.78 dB |
| Occupied channel bandwidth | 0.4 dB |
| Unwanted emission, conducted | 0.68 dB |
| Humidity | 6 % |
| Temperature | 2℃ |

This uncertainty represents an expanded uncertainty factor of $k$=2.

## 6.    EQUIPMENT AND TOOLS USED DURING TEST

### 6.1    TEST EQUIPMENT AND TOOLS

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| **Maximum transmit power & Maximum e.i.r.p. spectral density & Medium Utilisation (MU) factor &occupied channel bandwidth& Transmitter unwanted emissions in the out-of-band domain** | | | | |
| Simultaneous sampling DAQ | TONSCEND | JS0806-2 | 186060020 | 2023-07-24 |
| High and low temperature humid heat test chamber | HOSON | HS01060SDF | 201013401 | 2023-08-19 |
| Pulse power sensor | TONSCEND | u2021A | / | 2023-07-24 |
| Spectrum Analyzer | R&S | FSV30 | I04381 | 2023-11-18 |
| BT/WIFI System | TONSCEND | JS1120-3 | | |
| **Transmitter unwanted emissions in the spurious domain & Receiver spurious emissions** | | | | |
| Spectrum Analyzer | Agilent | N9020B | MY5712019 | 2023-11-09 |
| Bi-log Antenna | Schwarzbeck | VULB9163 | 01279 | 2023-03-15 |
| Horn Antenna | Schwarzbeck | BBHA9120D(1201) | 02143 | 2023-10-15 |
| Amplifier | Tonscend | TAP 037030 | AP20E8060081 | 2023-05-08 |
| Amplifier | Tonscend | TAP01018048 | AP20E8060075 | 2023-05-05 |
| Test software | tonscend | JS36-RSE/2.5.1.5 | | |
| **Receiver Blocking** | | | | |
| Signal Generator | Anritsu | MG3694A | #050125 | 2023-08-19 |
| BT/WIFI System | tonscend | Js1120-3 | | |

Note: The calibration interval of the above test instruments is 12 months .

## 6.2   LOCAL SUPPORTIVE INSTRUMENTS

| Name of Equipment | Manufacturer | Model | Serial Number | Note |
|---|---|---|---|---|
| Notebook | LENOVO | TianYi 310-14ISK | MP18DLC6 | / |
| Test board | / | / | / | / |

Note: The notebook is just used to produce fixed frequency transmitting.

| No. | Cable Type | Qty. | Shielded Type | Ferrite Core(Qty.) | Length |
|---|---|---|---|---|---|
| 1 | DC cable | 1 | No | 0 | 0.15m |
| 2 | DC cable | 1 | No | 0 | 1.2m |

## 6.3   CONFIGURATION OF SYSTEM UNDER TEST

EUT — 1 — Test board — 2 — Notebook

## 6.4   TEST SOFTWARE

| Software version | Test level |
|---|---|
| QCOM_V1.0 | 8.0 |

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## 7.    RADIO TECHNICAL REQUIREMENT SPECIFICATION

### 7.1    RF OUTPUT POWER

Test Requirement:          EN300 328 V2.2.2/ 4.3.2.2

Test Method:               EN300 328 V2.2.2/5.4.2.2.1

### 7.1.1    LIMIT

For adaptive equipment, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the manufacturer and shall not exceed 20 dBm. See clause 5.4.1 m). For non-adaptive equipment, the maximum RF output power shall be equal to or less than the value declared by the manufacturer.

This limit shall apply for any combination of power level and intended antenna assembly.

### 7.1.2    TEST CONFIGURATION
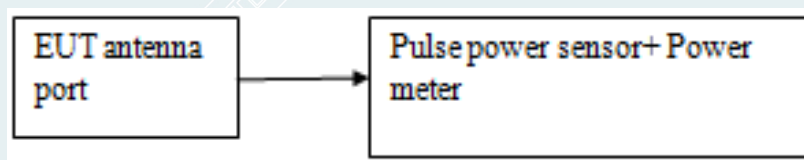


### 7.1.3    TEST PROCEDURES

Test procedure:          Test procedure is according to EN 300 328 V2.2.2/5.4.2.2.1

Test channel:            2405MHz,2440MHz and 2480MHz for Thread

Test condition:          Normal and extreme test conditions

### 7.1.4　TEST RESULTS

Test Date (yy-mm-dd):　　2023-01-31~2023-02-21

Test Engineer:　　　　　Yang Zhaoyun

Test environment:　　　　Normal condition:　　22.5℃/58%RH/101.0kPa

Extreme test conditions:　Low Temp:　　　　　-10℃

　　　　　　　　　　　　High Temp:　　　　　+50℃

| Test Mode | Test Frequency(MHz) | Measurement Conditions | Test Data | | | Max. e.i.r.p. Limit(dBm) | Conclusion |
|---|---|---|---|---|---|---|---|
| | | | Conducted Power (dBm) | Antenna Gain (dBi) | e.i.r.p. (dBm) | | |
| Thread | 2405 | Normal temperature/ Normal voltage | 7.75 | 1 | 8.75 | 20 | PASS |
| | 2440 | | 7.69 | 1 | 8.69 | 20 | PASS |
| | 2480 | | 7.41 | 1 | 8.41 | 20 | PASS |

| Test Mode | Test Frequency(MHz) | Measurement Conditions | Test Data | | | Max. e.i.r.p. Limit(dBm) | Conclusion |
|---|---|---|---|---|---|---|---|
| | | | Conducted Power (dBm) | Antenna Gain (dBi) | e.i.r.p. (dBm) | | |
| Thread | 2405 | Low temperature/ Normal voltage | 7.74 | 1 | 8.74 | 20 | PASS |
| | 2440 | | 7.69 | 1 | 8.69 | 20 | PASS |
| | 2480 | | 7.40 | 1 | 8.40 | 20 | PASS |

| Test Mode | Test Frequency(MHz) | Measurement Conditions | Test Data | | | Max. e.i.r.p. Limit(dBm) | Conclusion |
|---|---|---|---|---|---|---|---|
| | | | Conducted Power (dBm) | Antenna Gain (dBi) | e.i.r.p. (dBm) | | |
| Thread | 2405 | High temperature/ Normal voltage | 7.74 | 1 | 8.74 | 20 | PASS |
| | 2440 | | 7.69 | 1 | 8.69 | 20 | PASS |
| | 2480 | | 7.51 | 1 | 8.51 | 20 | PASS |

## 7.2    POWER SPECTRAL DENSITY

Test Requirement:        EN300 328 V2.2.2/4.3.2.3

Test Method:             EN300 328 V2.2.2/5.4.3.2.1

### 7.2.1    LIMIT

This requirement applies to all types of equipment using wide band modulations other than FHSS.

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10 dBm per MHz.

### 7.2.2    TEST CONFIGURATION
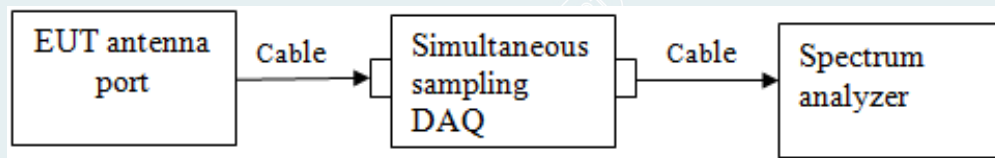


### 7.2.3    TEST PROCEDURES

Test condition:          Normal test conditions

Test channel:            2405MHz,2440MHz and 2480MHz for Thread

Test procedure:          Test procedure is according to EN 300 328 V2.2.2/5.4.3.2.1

### 7.2.4 TEST RESULTS

Test Date (yy-mm-dd):     2023-01-31~2023-02-21

Test Engineer:           Yang Zhaoyun

Test environment:        Normal condition:

                                    22.5℃/58%RH/101.0kPa

| Test Mode | Frequency [MHz] | PSD[dBm/MHz] | Limit[dBm/MHz] | Verdict |
|-----------|-----------------|--------------|----------------|---------|
| Thread    | 2405            | 7.47         | 10             | PASS    |
|           | 2440            | 7.27         | 10             | PASS    |
|           | 2480            | 7.04         | 10             | PASS    |

### 7.2.5 TEST SCREENSHOTS
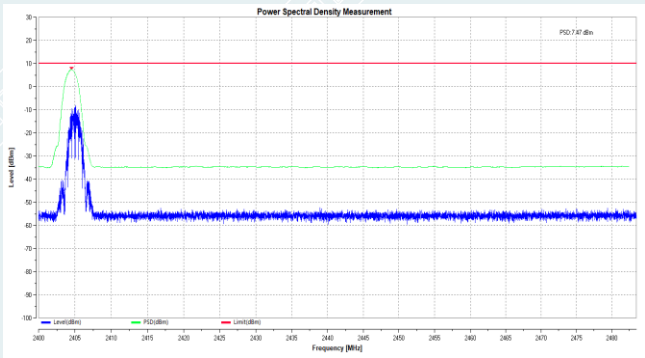


Lowest Frequency: 2405MHz
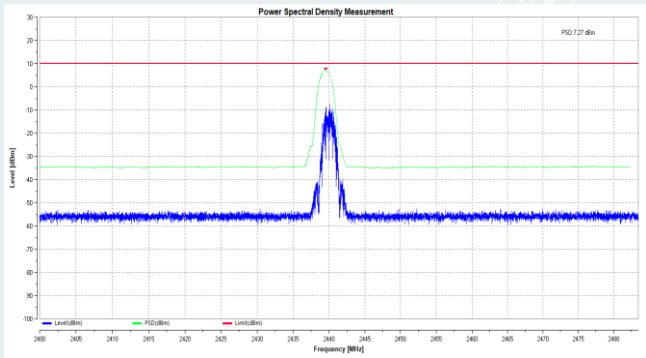


Middle Frequency: 2440MHz
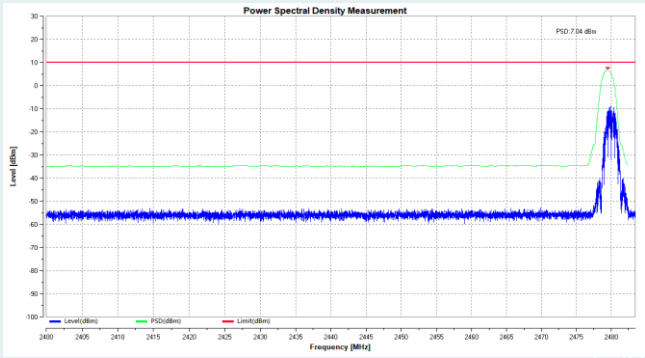


Highest Frequency: 2480MHz

## 7.3    OCCUPIED CHANNEL BANDWIDTH

Test Requirement:        EN300 328 V2.2.2/ 4.3.2.7

Test Method:             EN300 328 V2.2.2/5.4.7.2.1

### 7.3.1    LIMIT

This requirement applies to all types of non-FHSS equipment.

The Occupied Channel Bandwidth shall fall completely within the band given in table 2.

In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p. greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

Table 2: Service frequency bands

|          | Service frequency bands   |
|----------|---------------------------|
| Transmit | 2 400 MHz to 2 483,5 MHz  |
| Receive  | 2 400 MHz to 2 483,5 MHz  |

### 7.3.2    TEST CONFIGURATION
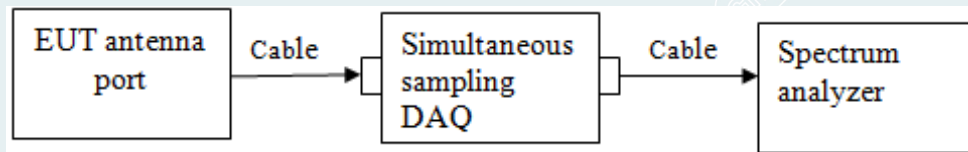


### 7.3.3    TEST PROCEDURES

Test condition:        Normal test conditions.

Test channel:          2405MHz,2440MHz and 2480MHz for Thread

Test procedure:        Test procedure is according to EN 300 328 V2.2.2/5.4.7.2.1

### 7.3.4    TEST RESULTS

Test Date (yy-mm-dd):        2023-01-31~2023-02-21

Test Engineer:                    Yang Zhaoyun

Test environment:               Normal condition:

22.5℃/58%RH/101.0kPa

| Test Mode | Frequency [MHz] | OCB[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|-----------------|----------|---------|---------|------------|---------|
| Thread | 2405 | 2.0551 | 2403.9987 | 2406.0538 | 2400 to 2483.5 | PASS |
| | 2440 | 2.0724 | 2438.9913 | 2441.0637 | 2400 to 2483.5 | PASS |
| | 2480 | 2.0828 | 2478.9825 | 2481.0653 | 2400 to 2483.5 | PASS |

### 7.3.5    TEST SCREENSHOTS



Lowest Frequency: 2405MHz
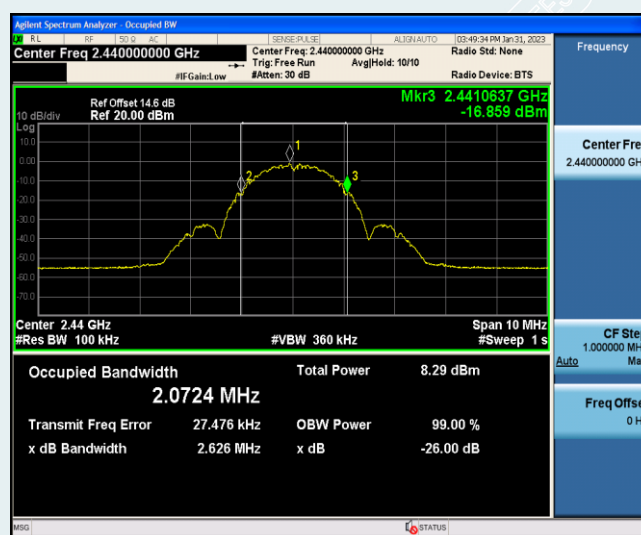


Middle Frequency: 2440MHz
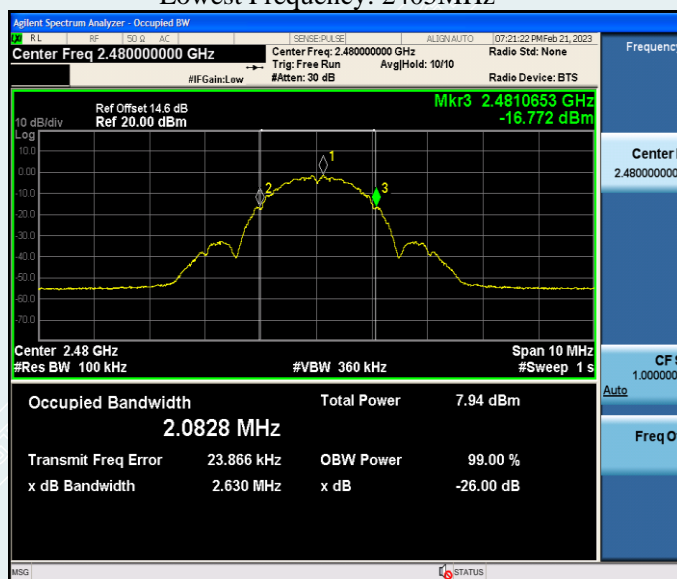


Highest Frequency: 2480MHz

## 7.4    TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

Test Requirement:        EN300 328 V2.2.2/ 4.3.2.8

Test Method:             EN300 328 V2.2.2/5.4.8.2.1

### 7.4.1    LIMIT

This requirement applies to all types of FHSS equipment and all types of non-FHSS equipment.

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 3.

The Out-of-band emissions are fulfilled by compliance with the Occupied Channel Bandwidth requirement.
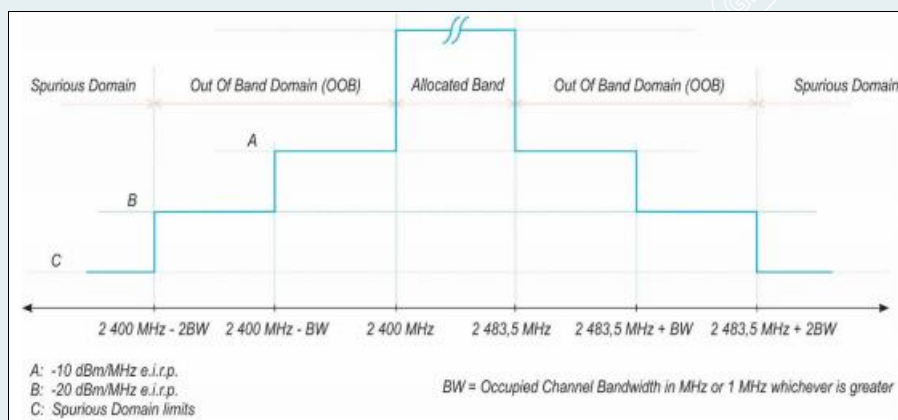


### 7.4.2    TEST CONFIGURATION
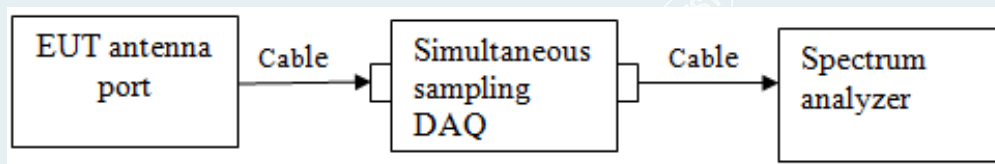


### 7.4.3    TEST PROCEDURES

Test condition:          Normal test conditions.

Test channel:            2405MHz, 2480MHz for Thread

Test procedure:          Test procedure is according to EN 300 328 V2.2.2/5.4.8.2.1

### 7.4.4 TEST RESULTS

Test Date (yy-mm-dd):    2023-01-31~2023-02-21

Test Engineer:    Yang Zhaoyun

Test environment:    Normal condition:

22.5℃/58%RH/101.0kPa

| Test Mode | Frequency [MHz] | Freq. [MHz] | Level[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| Thread | 2405 | 2396.3898 | -45.45 | -20.00 | PASS |
| | | 2396.4449 | -45.52 | -20.00 | PASS |
| | | 2397.4449 | -45.11 | -20.00 | PASS |
| | | 2398.4449 | -44.44 | -10.00 | PASS |
| | | 2398.5 | -44.78 | -10.00 | PASS |
| | | 2399.5 | -44.89 | -10.00 | PASS |
| | | 2484 | -45.64 | -10.00 | PASS |
| | | 2485 | -45.08 | -10.00 | PASS |
| | | 2485.0551 | -45.52 | -10.00 | PASS |
| | | 2486.0551 | -45.13 | -20.00 | PASS |
| | | 2487.0551 | -45.93 | -20.00 | PASS |
| | | 2487.1102 | -45.94 | -20.00 | PASS |
| | 2480 | 2396.3344 | -45.77 | -20.00 | PASS |
| | | 2396.4172 | -45.14 | -20.00 | PASS |
| | | 2397.4172 | -46.33 | -20.00 | PASS |
| | | 2398.4172 | -45.84 | -10.00 | PASS |
| | | 2398.5 | -45.71 | -10.00 | PASS |
| | | 2399.5 | -45.90 | -10.00 | PASS |
| | | 2484 | -43.18 | -10.00 | PASS |
| | | 2485 | -43.93 | -10.00 | PASS |
| | | 2485.0828 | -44.25 | -10.00 | PASS |
| | | 2486.0828 | -44.84 | -20.00 | PASS |
| | | 2487.0828 | -44.13 | -20.00 | PASS |
| | | 2487.1656 | -44.56 | -20.00 | PASS |

### 7.4.5    TEST SCREENSHOTS

Modulation Type: Thread (2405MHz)
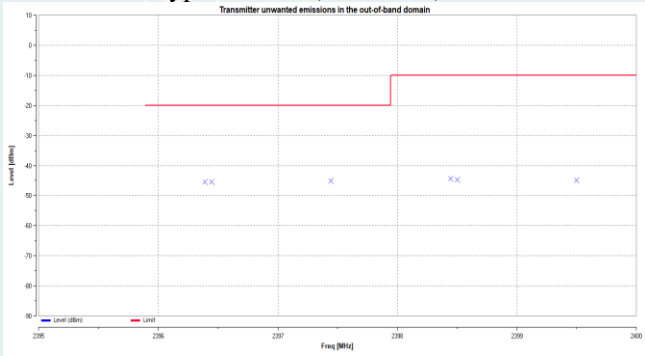


Left side of working frequency band
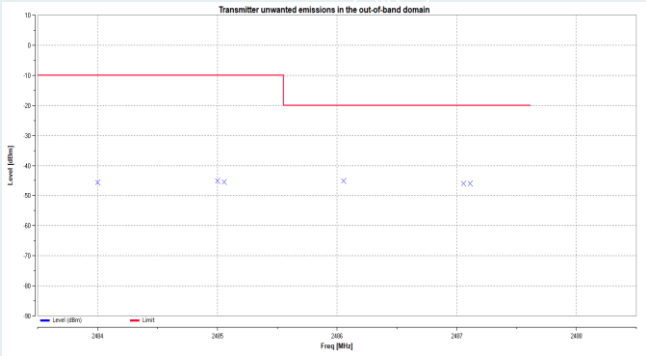


Right side of working frequency band

Modulation Type: Thread (2480MHz)



Left side of working frequency band
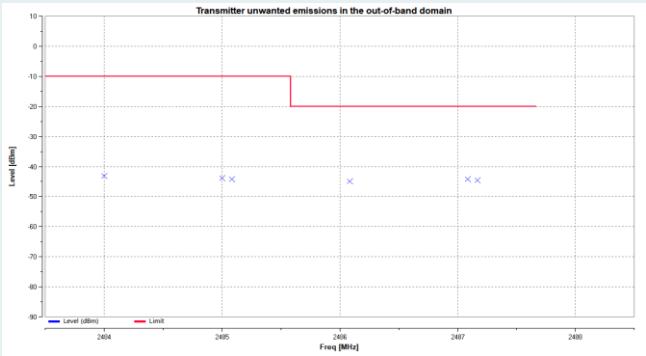


Right side of working frequency band

## 7.5　　TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

Test Requirement:　　　　EN300 328 V2.2.2/ 4.3.2.9

Test Method:　　　　EN300 328 V2.2.2/5.4.9.2.2

### 7.5.1　　LIMIT

This requirement applies to all types of non-FHSS equipment.

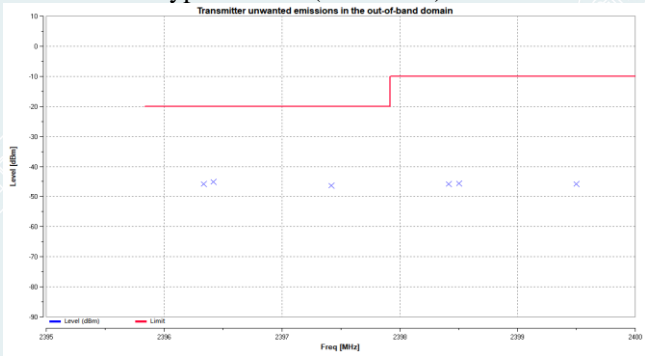The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 2. In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

Note: This test uses conducted emissions measurement and Radiated emissions measurement.

Table 2: Transmitter limits for spurious emissions

| Frequency range | Maximum power | Bandwidth |
|---|---|---|
| 30 MHz to 47 MHz | -36 dBm | 100 kHz |
| 47 MHz to 74 MHz | -54 dBm | 100 kHz |
| 74 MHz to 87,5 MHz | -36 dBm | 100 kHz |
| 87,5 MHz to 118 MHz | -54 dBm | 100 kHz |
| 118 MHz to 174 MHz | -36 dBm | 100 kHz |
| 174 MHz to 230 MHz | -54 dBm | 100 kHz |
| 230 MHz to 470 MHz | -36 dBm | 100 kHz |
| 470 MHz to 694 MHz | -54 dBm | 100 kHz |
| 694 MHz to 1 GHz | -36 dBm | 100 kHz |
| 1 GHz to 12,75 GHz | -30 dBm | 1 MHz |

### 7.5.2　　TEST CONFIGURATION
　　30MHz~1000MHz
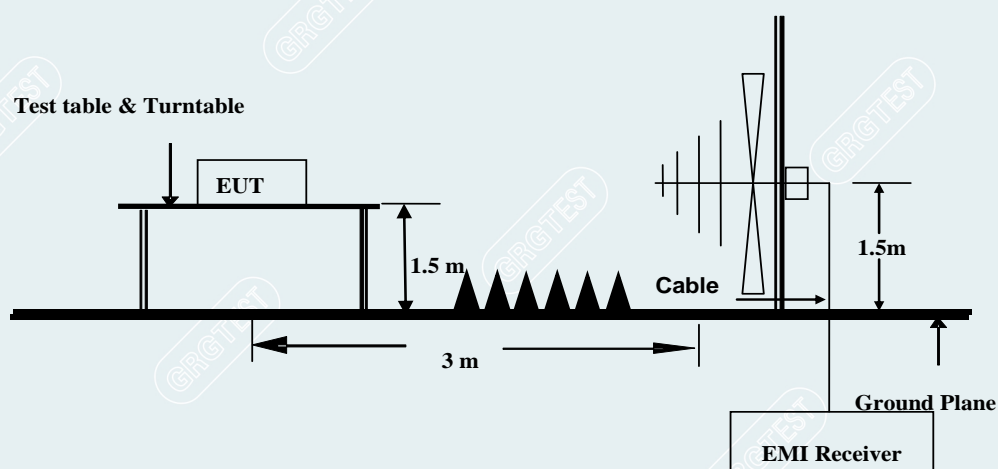
**1000MHz~12750MHz**
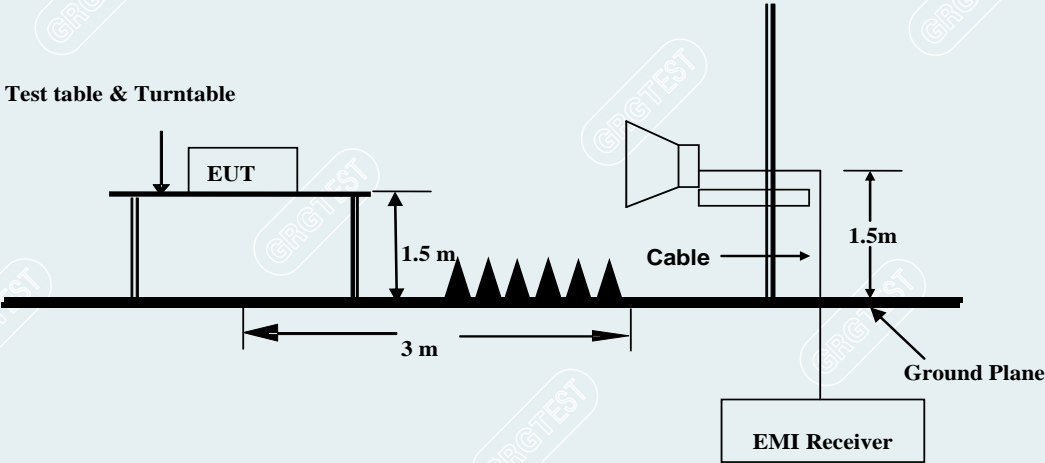


### 7.5.3    TEST PROCEDURES

Test condition:            Normal test conditions.

Test channel:             Lowest channel: (2405MHz), Highest channel: (2480MHz)

Test procedure:           Test procedure is according to Clause 5.4.9.2.2 of EN 300 328 V2.2.2

### 7.5.4    DATA SAMPLE

| Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB/m] | Detector | Polarity |
|---|---|---|---|---|---|---|---|
| XXX | -49.71 | -57.90 | -30.00 | 27.90 | -8.19 | RMS | Horizontal |

| | |
|---|---|
| Frequency (MHz) | = Emission frequency in MHz |
| Reading (dBm) | = Uncorrected Analyzer / Receiver reading |
| Correct Factor (dB/m) | = Antenna factor + Cable loss – Amplifier gain |
| Result (dBm) | = Reading (dBm) + Corr. Factor (dB/m) |
| Limit (dBm) | = Limit stated in standard |
| Margin (dB) | = Result (dBm) – Limit(dBm) |
| RMS | = Root Mean Square |

### 7.5.5    TEST RESULTS

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | TX Thread_2405MHz | Voltage: | DC 3.0V |
| Environment: | 22.3℃/56%RH/101.0kPa | Test Engineer: | Zhang Qiang |
| Test Date: | 2023-02-01 | / | / |
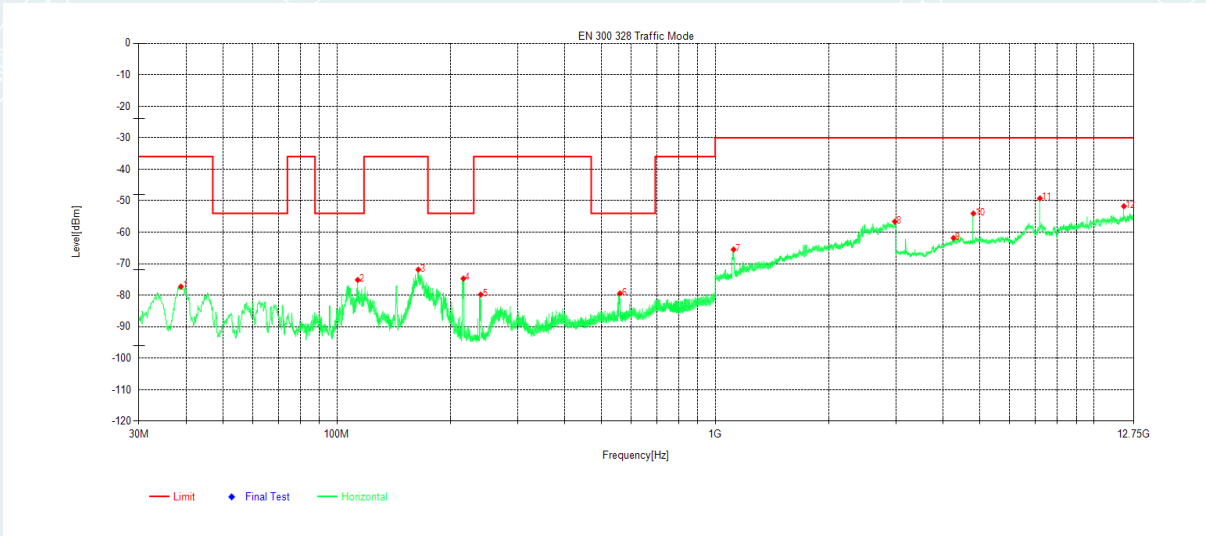


**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 38.73 | -63.30 | -77.28 | -36.00 | 41.28 | -13.98 | RMS | Horizontal |
| 2 | 113.517 | -57.28 | -75.14 | -54.00 | 21.14 | -17.86 | RMS | Horizontal |
| 3 | 164.151 | -52.19 | -71.88 | -36.00 | 35.88 | -19.69 | RMS | Horizontal |
| 4 | 215.949 | -57.37 | -74.70 | -54.00 | 20.70 | -17.33 | RMS | Horizontal |
| 5 | 240.005 | -63.50 | -79.79 | -36.00 | 43.79 | -16.29 | RMS | Horizontal |
| 6 | 559.911 | -70.26 | -79.43 | -54.00 | 25.43 | -9.17 | RMS | Horizontal |
| 7 | 1118.6 | -63.37 | -65.48 | -30.00 | 35.48 | -2.11 | RMS | Horizontal |
| 8 | 2981.6 | -70.27 | -56.61 | -30.00 | 26.61 | 13.66 | RMS | Horizontal |
| 9 | 4263.6 | -59.67 | -61.85 | -30.00 | 31.85 | -2.18 | RMS | Horizontal |
| 10 | 4810.575 | -52.13 | -54.03 | -30.00 | 24.03 | -1.90 | RMS | Horizontal |
| 11 | 7213.95 | -54.19 | -49.26 | -30.00 | 19.26 | 4.93 | RMS | Horizontal |
| 12 | 12027.52 | -64.86 | -51.74 | -30.00 | 21.74 | 13.12 | RMS | Horizontal |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | TX Thread_2405MHz | Voltage: | DC 3.0V |
| Environment: | 22.3℃/56%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Date: | 2023-02-01 | / | / |
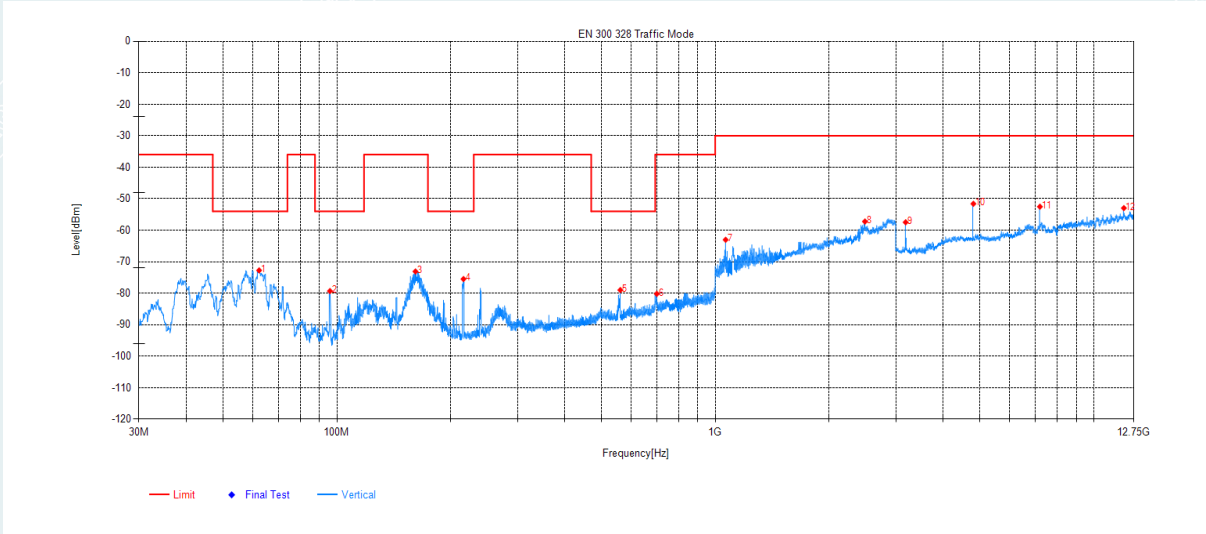


**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 62.301 | -58.99 | -72.74 | -54.00 | 18.74 | -13.75 | RMS | Vertical |
| 2 | 95.863 | -59.98 | -79.30 | -54.00 | 25.30 | -19.32 | RMS | Vertical |
| 3 | 161.338 | -55.40 | -73.09 | -36.00 | 37.09 | -17.69 | RMS | Vertical |
| 4 | 216.143 | -57.96 | -75.48 | -54.00 | 21.48 | -17.52 | RMS | Vertical |
| 5 | 561.463 | -69.55 | -78.99 | -54.00 | 24.99 | -9.44 | RMS | Vertical |
| 6 | 700.949 | -73.78 | -80.20 | -36.00 | 44.20 | -6.42 | RMS | Vertical |
| 7 | 1065.4 | -60.35 | -63.03 | -30.00 | 33.03 | -2.68 | RMS | Vertical |
| 8 | 2488 | -69.68 | -57.23 | -30.00 | 27.23 | 12.45 | RMS | Vertical |
| 9 | 3186.225 | -50.71 | -57.47 | -30.00 | 27.47 | -6.76 | RMS | Vertical |
| 10 | 4810.575 | -49.91 | -51.60 | -30.00 | 21.60 | -1.69 | RMS | Vertical |
| 11 | 7213.95 | -57.40 | -52.51 | -30.00 | 22.51 | 4.89 | RMS | Vertical |
| 12 | 12023.62 | -66.23 | -52.97 | -30.00 | 22.97 | 13.26 | RMS | Vertical |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | TX Thread_2480MHz | Voltage: | DC 3.0V |
| Environment: | 23.2℃/58%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Date: | 2023-02-20 | / | / |
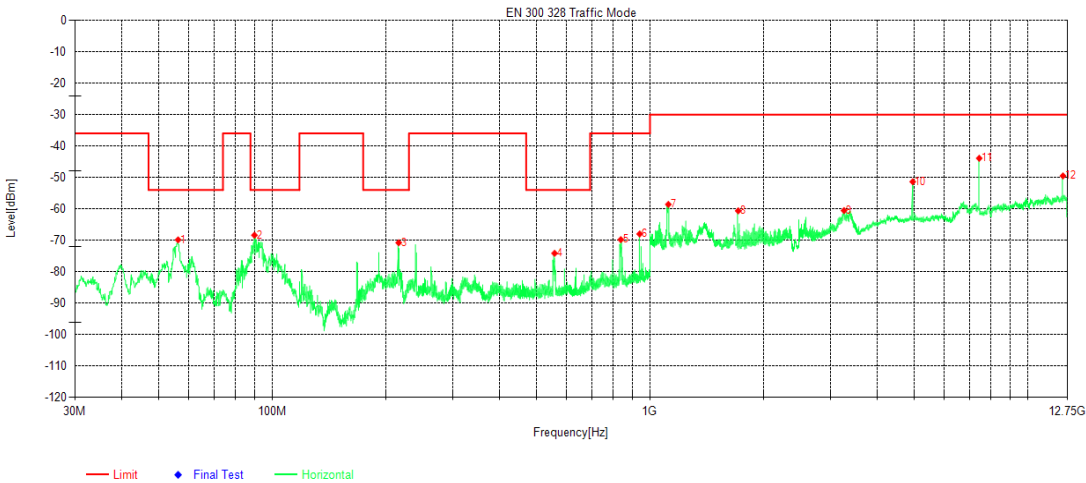


### Suspected Data List

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 56.287 | -53.31 | -69.87 | -54.00 | 15.87 | -16.56 | RMS | Horizontal |
| 2 | 89.655 | -53.52 | -68.38 | -54.00 | 14.38 | -14.86 | RMS | Horizontal |
| 3 | 216.046 | -53.45 | -70.77 | -54.00 | 16.77 | -17.32 | RMS | Horizontal |
| 4 | 558.65 | -64.95 | -74.15 | -54.00 | 20.15 | -9.20 | RMS | Horizontal |
| 5 | 836.555 | -64.92 | -69.80 | -36.00 | 33.80 | -4.88 | RMS | Horizontal |
| 6 | 939.084 | -65.35 | -68.00 | -36.00 | 32.00 | -2.65 | RMS | Horizontal |
| 7 | 1118 | -43.98 | -58.59 | -30.00 | 28.59 | -14.61 | RMS | Horizontal |
| 8 | 1711.8 | -47.57 | -60.63 | -30.00 | 30.63 | -13.06 | RMS | Horizontal |
| 9 | 3263.25 | -53.77 | -60.56 | -30.00 | 30.56 | -6.79 | RMS | Horizontal |
| 10 | 4959.75 | -50.35 | -51.38 | -30.00 | 21.38 | -1.03 | RMS | Horizontal |
| 11 | 7440.15 | -48.76 | -43.92 | -30.00 | 13.92 | 4.84 | RMS | Horizontal |
| 12 | 12400.95 | -62.22 | -49.51 | -30.00 | 19.51 | 12.71 | RMS | Horizontal |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | TX Thread_2480MHz | Voltage: | DC 3.0V |
| Environment: | 23.2℃/58%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Date: | 2023-02-20 | / | / |
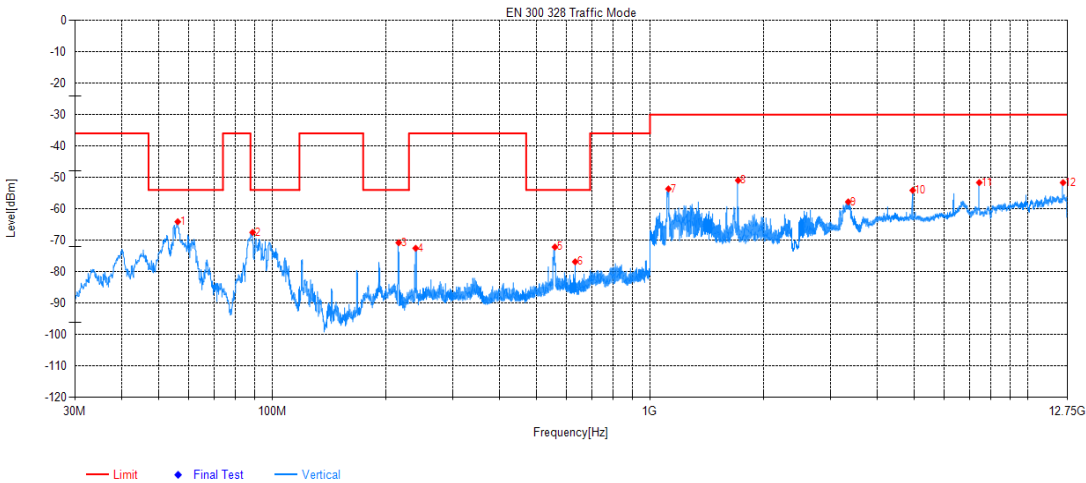


**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 56.19 | -52.41 | -64.10 | -54.00 | 10.10 | -11.69 | RMS | Vertical |
| 2 | 88.685 | -49.54 | -67.48 | -54.00 | 13.48 | -17.94 | RMS | Vertical |
| 3 | 216.046 | -53.26 | -70.78 | -54.00 | 16.78 | -17.52 | RMS | Vertical |
| 4 | 239.52 | -57.04 | -72.53 | -36.00 | 36.53 | -15.49 | RMS | Vertical |
| 5 | 560.008 | -62.62 | -72.16 | -54.00 | 18.16 | -9.54 | RMS | Vertical |
| 6 | 633.631 | -69.32 | -76.86 | -54.00 | 22.86 | -7.54 | RMS | Vertical |
| 7 | 1118.4 | -39.41 | -53.66 | -30.00 | 23.66 | -14.25 | RMS | Vertical |
| 8 | 1711.8 | -38.20 | -50.95 | -30.00 | 20.95 | -12.75 | RMS | Vertical |
| 9 | 3348.075 | -51.61 | -57.79 | -30.00 | 27.79 | -6.18 | RMS | Vertical |
| 10 | 4959.75 | -53.22 | -54.12 | -30.00 | 24.12 | -0.90 | RMS | Vertical |
| 11 | 7440.15 | -56.57 | -51.65 | -30.00 | 21.65 | 4.92 | RMS | Vertical |
| 12 | 12400.95 | -64.31 | -51.66 | -30.00 | 21.66 | 12.65 | RMS | Vertical |

## 7.6      RECEIVER SPURIOUS EMISSIONS

Test Requirement:          EN300 328 V2.2.2

Test Method:              EN300 328 V2.2.2

### 7.6.1     LIMIT

The spurious emissions of the receiver shall not exceed the values given in table 3.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted).

For emissions radiated by the cabinet or for emissions radiated by integral antenna equipment (without antenna

connectors), these limits are e.r.p for emissions up to 1 GHz and e.i.r.p for emissions above 1 GHz.
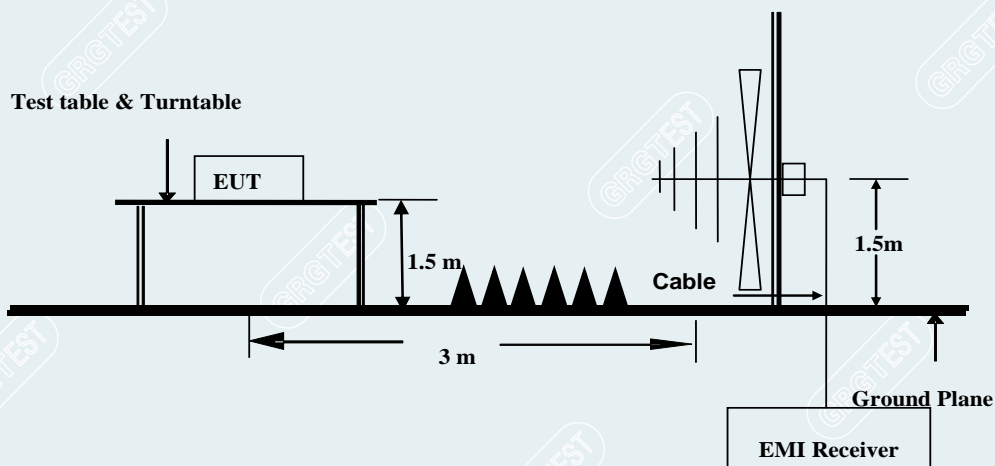
This device uses Radiated measurement.
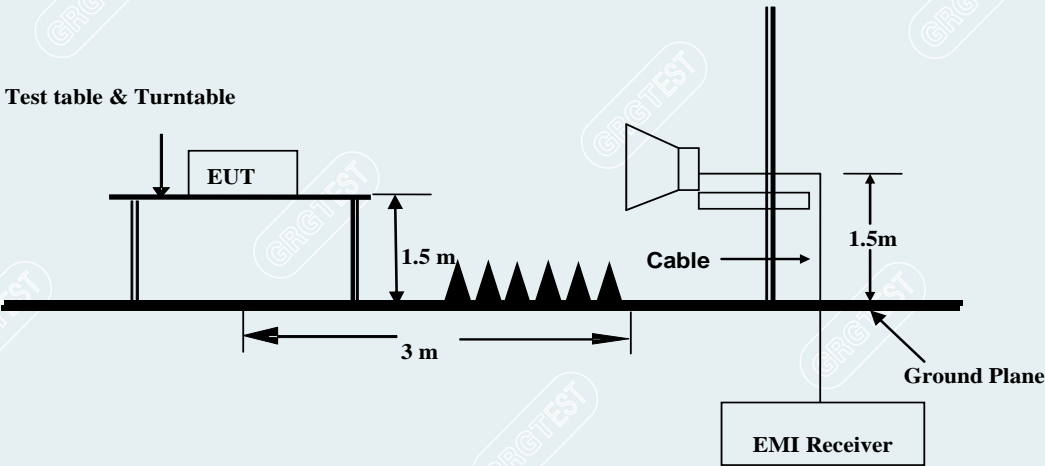
Table 3: Spurious emission limits for receivers

| Frequency range | Maximum power | Bandwidth |
|---|---|---|
| 30 MHz to 1 GHz | -57 dBm | 100 kHz |
| 1 GHz to 12,75 GHz | -47 dBm | 1 MHz |

### 7.6.2     TEST CONFIGURATION

**30MHz-1000MHz**

**1000MHz-12750MHz**



## 7.6.3    TEST PROCEDURES

Test channel:              Lowest channel: (2405MHz), Highest channel: (2480MHz)

Test condition:            Normal test conditions.

Test procedure:            Test procedure is according to Clause 5.4.10.2.2 of EN 300 328 V2.2.2

## 7.6.4    DATA SAMPLE

| Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB/m] | Detector | Polarity |
|---|---|---|---|---|---|---|---|
| XXX | -58.02 | -73.33 | -57.00 | 16.33 | -15.31 | RMS | Horizontal |

Frequency (MHz)                    = Emission frequency in MHz

Reading (dBm)                      = Uncorrected Analyzer / Receiver reading

Correct Factor (dB/m)              = Antenna factor + Cable loss – Amplifier gain

Result (dBm)                       = Reading (dBm) + Corr. Factor (dB/m)

Limit (dBm)                        = Limit stated in standard

Margin (dB)                        = Result (dBm) – Limit(dBm)

RMS                                 = Root Mean Square

### 7.6.5 TEST RESULTS
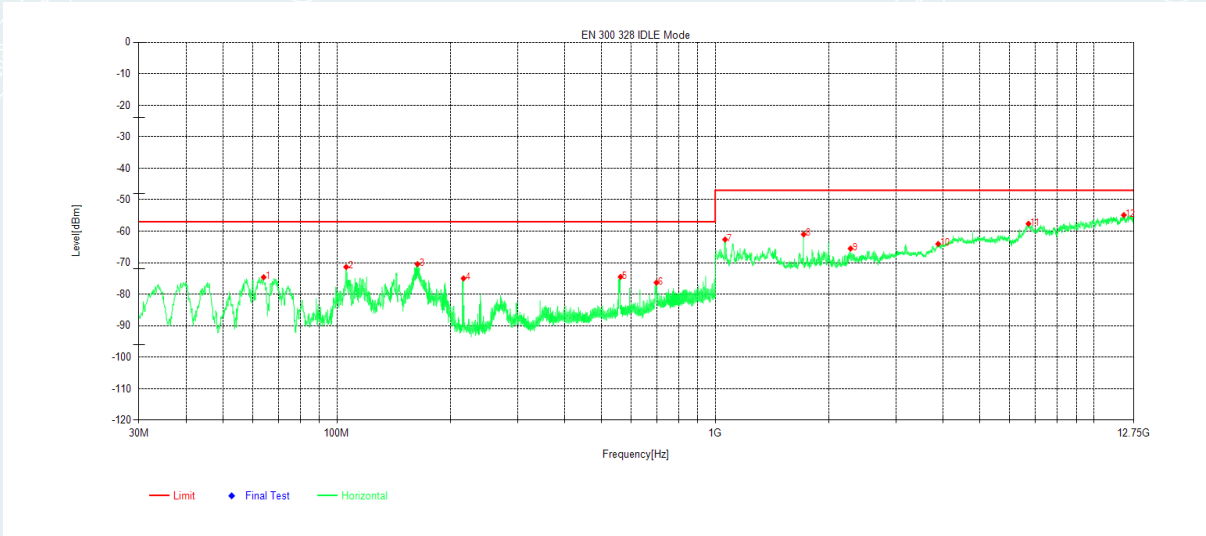
| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | RX Thread_2405MHz | Voltage: | DC 3.0V |
| Environment: | 22.3℃/56%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Data: | 2023-02-01 | / | / |



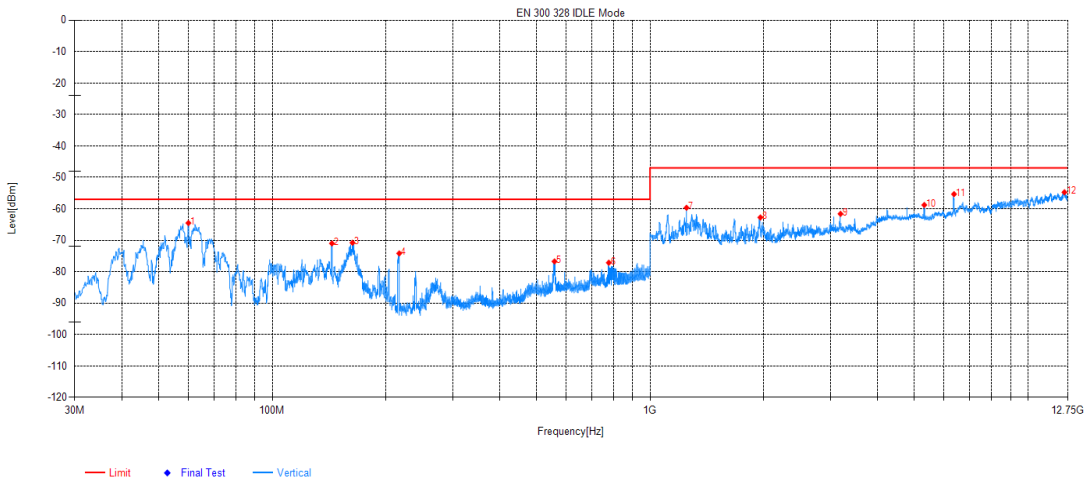| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
| 1 | 64.047 | -55.24 | -74.60 | -57.00 | 17.60 | -19.36 | RMS | Horizontal |
| 2 | 105.854 | -54.12 | -71.35 | -57.00 | 14.35 | -17.23 | RMS | Horizontal |
| 3 | 163.375 | -50.71 | -70.43 | -57.00 | 13.43 | -19.72 | RMS | Horizontal |
| 4 | 216.143 | -57.65 | -74.97 | -57.00 | 17.97 | -17.32 | RMS | Horizontal |
| 5 | 561.948 | -65.43 | -74.49 | -57.00 | 17.49 | -9.06 | RMS | Horizontal |
| 6 | 699.3 | -69.84 | -76.32 | -57.00 | 19.32 | -6.48 | RMS | Horizontal |
| 7 | 1062.275 | -49.26 | -62.62 | -47.00 | 15.62 | -13.36 | RMS | Horizontal |
| 8 | 1713.225 | -47.74 | -60.98 | -47.00 | 13.98 | -13.24 | RMS | Horizontal |
| 9 | 2278.4 | -54.88 | -65.49 | -47.00 | 18.49 | -10.61 | RMS | Horizontal |
| 10 | 3882.275 | -59.89 | -64.04 | -47.00 | 17.04 | -4.15 | RMS | Horizontal |
| 11 | 6728.125 | -63.04 | -57.61 | -47.00 | 10.61 | 5.43 | RMS | Horizontal |
| 12 | 12021.5 | -68.09 | -54.88 | -47.00 | 7.88 | 13.21 | RMS | Horizontal |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | RX Thread_2405MHz | Voltage: | DC 3.0V |
| Environment: | 22.3℃/56%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Data: | 2023-02-01 | / | / |



**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 59.973 | -52.02 | -64.52 | -57.00 | 7.52 | -12.50 | RMS | Vertical |
| 2 | 143.781 | -51.70 | -71.00 | -57.00 | 14.00 | -19.30 | RMS | Vertical |
| 3 | 162.987 | -53.03 | -70.77 | -57.00 | 13.77 | -17.74 | RMS | Vertical |
| 4 | 216.725 | -56.67 | -74.18 | -57.00 | 17.18 | -17.51 | RMS | Vertical |
| 5 | 558.553 | -67.18 | -76.74 | -57.00 | 19.74 | -9.56 | RMS | Vertical |
| 6 | 777.773 | -71.57 | -77.14 | -57.00 | 20.14 | -5.57 | RMS | Vertical |
| 7 | 1249.1 | -47.08 | -59.65 | -47.00 | 12.65 | -12.57 | RMS | Vertical |
| 8 | 1958.8 | -51.07 | -62.76 | -47.00 | 15.76 | -11.69 | RMS | Vertical |
| 9 | 3193.725 | -54.59 | -61.61 | -47.00 | 14.61 | -7.02 | RMS | Vertical |
| 10 | 5322.825 | -58.54 | -58.79 | -47.00 | 11.79 | -0.25 | RMS | Vertical |
| 11 | 6376.8 | -56.93 | -55.33 | -47.00 | 8.33 | 1.60 | RMS | Vertical |
| 12 | 12506.77 | -69.61 | -54.73 | -47.00 | 7.73 | 14.88 | RMS | Vertical |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | RX Thread_2480MHz | Voltage: | DC 3.0V |
| Environment: | 23.2℃/58%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Data: | 2023-02-20 | / | / |
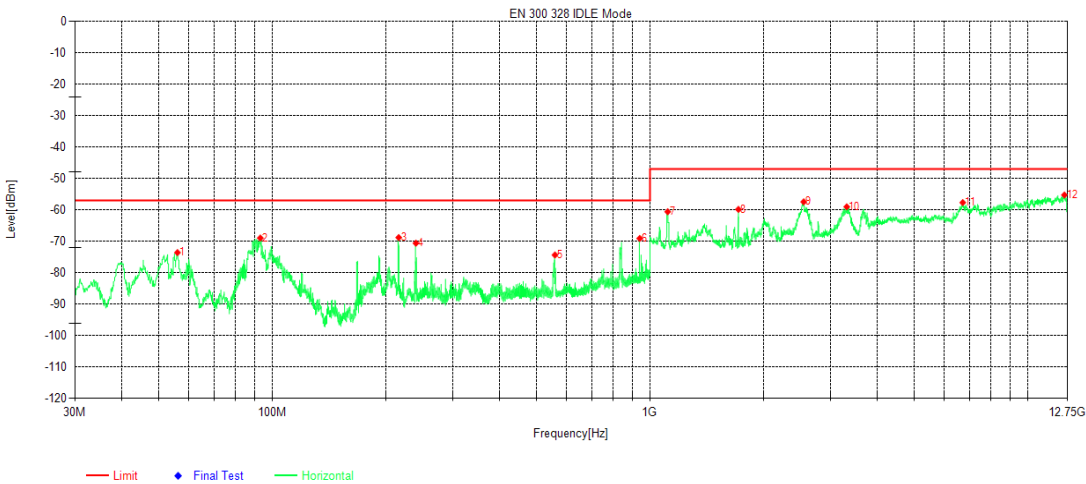


**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 56.093 | -57.08 | -73.61 | -57.00 | 16.61 | -16.53 | RMS | Horizontal |
| 2 | 92.953 | -54.53 | -68.96 | -57.00 | 11.96 | -14.43 | RMS | Horizontal |
| 3 | 216.046 | -51.50 | -68.82 | -57.00 | 11.82 | -17.32 | RMS | Horizontal |
| 4 | 240.005 | -54.31 | -70.60 | -57.00 | 13.60 | -16.29 | RMS | Horizontal |
| 5 | 560.105 | -65.20 | -74.36 | -57.00 | 17.36 | -9.16 | RMS | Horizontal |
| 6 | 938.987 | -66.44 | -69.10 | -57.00 | 12.10 | -2.66 | RMS | Horizontal |
| 7 | 1113.975 | -46.37 | -60.59 | -47.00 | 13.59 | -14.22 | RMS | Horizontal |
| 8 | 1714.4 | -46.60 | -59.85 | -47.00 | 12.85 | -13.25 | RMS | Horizontal |
| 9 | 2551 | -47.70 | -57.45 | -47.00 | 10.45 | -9.75 | RMS | Horizontal |
| 10 | 3315.925 | -52.14 | -59.03 | -47.00 | 12.03 | -6.89 | RMS | Horizontal |
| 11 | 6731.65 | -63.14 | -57.70 | -47.00 | 10.70 | 5.44 | RMS | Horizontal |
| 12 | 12505.6 | -69.98 | -55.28 | -47.00 | 8.28 | 14.70 | RMS | Horizontal |

| Project No | E20230128179401 | EUT: | Door and Window Sensor P2 |
|---|---|---|---|
| Model: | DW-S02E | Sample No: | E20230128179401-0001 |
| Mode: | RX Thread_2480MHz | Voltage: | DC 3.0V |
| Environment: | 23.2℃/58%RH/101.0kPa | Engineer: | Zhang Qiang |
| Test Data: | 2023-02-20 | / | / |
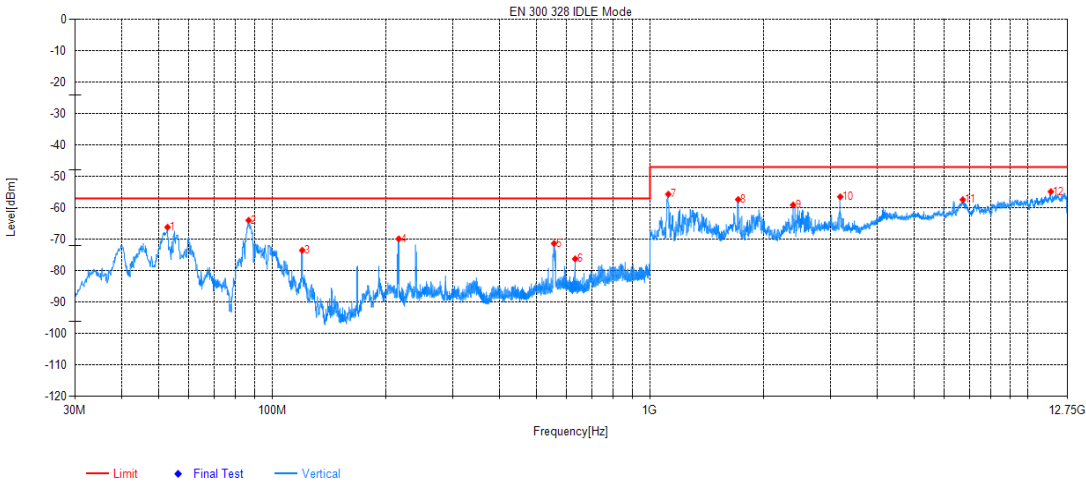


**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBm] | Level [dBm] | Limit [dBm] | Margin [dB] | Factor [dB] | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 52.795 | -54.30 | -66.17 | -57.00 | 9.17 | -11.87 | RMS | Vertical |
| 2 | 86.551 | -44.83 | -63.98 | -57.00 | 6.98 | -19.15 | RMS | Vertical |
| 3 | 120.016 | -51.91 | -73.52 | -57.00 | 16.52 | -21.61 | RMS | Vertical |
| 4 | 216.143 | -52.35 | -69.87 | -57.00 | 12.87 | -17.52 | RMS | Vertical |
| 5 | 557.195 | -61.77 | -71.35 | -57.00 | 14.35 | -9.58 | RMS | Vertical |
| 6 | 633.631 | -68.71 | -76.25 | -57.00 | 19.25 | -7.54 | RMS | Vertical |
| 7 | 1117.5 | -41.81 | -55.68 | -47.00 | 8.68 | -13.87 | RMS | Vertical |
| 8 | 1712.05 | -44.41 | -57.34 | -47.00 | 10.34 | -12.93 | RMS | Vertical |
| 9 | 2392.375 | -48.15 | -59.11 | -47.00 | 12.11 | -10.96 | RMS | Vertical |
| 10 | 3189.025 | -49.45 | -56.48 | -47.00 | 9.48 | -7.03 | RMS | Vertical |
| 11 | 6731.65 | -63.11 | -57.42 | -47.00 | 10.42 | 5.69 | RMS | Vertical |
| 12 | 11516.25 | -68.65 | -54.84 | -47.00 | 7.84 | 13.81 | RMS | Vertical |

## 7.7    RECEIVER BLOCKING

Test Requirement:        EN300 328 V2.2.2/ 5.4.11.1

Test Method:             EN300 328 V2.2.2/ 5.4.11.2

### 7.7.1    LIMIT

For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

The blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for.

**Receiver Blocking parameters for Receiver Category 1 equipment**

| Wanted signal mean power from companion device (dBm) (see notes 1 and 4) | Blocking Signal frequency (MHz) | Blocking signal power (dBm) (see note 4) | Type of blocking signal |
|---|---|---|---|
| $(-133\text{dBm}+10 \times \log_{10}(\text{OCBW}))$ or -68dBm whichever is less (see note 2) | 2380 2504 | -34 | CW |
| $(-139\text{dBm}+10 \times \log_{10}(\text{OCBW}))$ or -74dBm whichever is less (see note 3) | 2300 2330 2360 2524 2584 2674 | | |

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 26 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 20 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured positioned as recorded in clause 5.4.3.2.2.

**Receiver Blocking parameters for Receiver Category 2 equipment**

| Wanted signal mean power from companion device (dBm) (see notes 1 and 3) | Blocking Signal frequency (MHz) | Blocking signal power (dBm) (see note 3) | Type of blocking signal |
|---|---|---|---|
| $(-139\text{dBm}+10 \times \log_{10}(\text{OCBW})+10\text{dBm})$ or $(-74\text{dBm}+10\text{dBm})$ whichever is less (see note 2) | 2380 2504 2300 2584 | -34 | CW |

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 26 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

**Receiver Blocking parameters for Receiver Category 3 equipment**

| Wanted signal mean power from companion device (dBm) (see notes 1 and 3) | Blocking Signal frequency (MHz) | Blocking signal power (dBm) (see note 3) | Type of blocking signal |
|---|---|---|---|
| $(-139\text{dBm}+10 \times \log_{10}(\text{OCBW})+20\text{dBm})$ or $(-74\text{dBm}+20\text{dBm})$ whichever is less (see note 2) | 2380 2504 2300 2584 | -34 | CW |

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 30 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

### 7.7.2    TEST CONFIGURATION
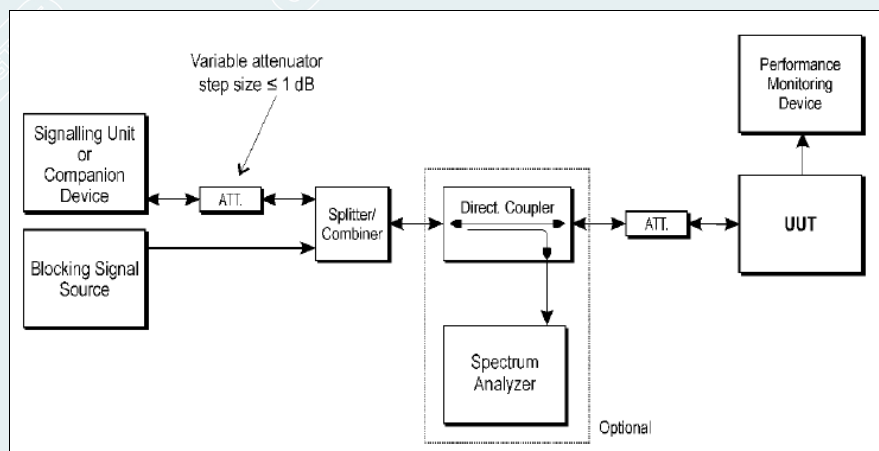


### 7.7.3    TEST PROCEDURES

Test condition:        Keep the EUT on the lowest and Highest channel working mode.

Test procedure:        Step1：
Test condition:        For non-FHSS equipment, the UUT shall be set to the lowest operating channel on which
the blocking test has to be performed (see clause 5.4.11.1).
Step 2:
The blocking signal generator is set to the first frequency as defined in the appropriate
table corresponding to the receiver category and type of equipment.
Step 3:
With the blocking signal generator switched off, a communication link is established
between the UUT and the associated companion device using the test setup shown in
figure 6.
Unless the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1
is used, the level of the wanted signal shall be set to the value provided in the table
corresponding to the receiver category and type of equipment. The test procedure defined
in clause 5.4.2, and more in particular clause 5.4.2.2.1.2, can be used to measure the
(conducted) level of the wanted signal however no correction shall be made for antenna
gain of
the companion device (step 6 in clause 5.4.2.2.1.2 shall be ignored). This level may be
measured directly at the output of the companion device and a correction is made for the
coupling loss into the UUT. The actual level for the wanted signal shall be recorded in the
test report.
When the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1
is used, the attenuation of the variable attenuator shall be increased in 1 dB steps to a
value at which the minimum performance criteria as specified in clause 4.3.1.12.3 or
clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the
UUT is Pmin. This signal level (Pmin) is increased by the value provided in note 2 of the
applicable table corresponding to the receiver category and type of equipment.
Step 4:
The blocking signal at the UUT is set to the level provided in the table corresponding to
the receiver category and type of equipment.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 are met
then proceed to step 6.
Step 5:
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is not met,
step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in
step 2 has been increased with a value equal to the Occupied Channel Bandwidth except:
- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or
equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted

signal shall be increased by 3 dB.
- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still not met, step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in step 2 has been decreased with a value equal to the Occupied Channel Bandwidth except:
- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.
- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be increased by 3 dB.
If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still not met, the UUT fails to comply with the Receiver Blocking requirement and step 6 and step 7 are no longer required.
It shall be recorded in the test report whether the shift of blocking frequencies as described in the present step was used.
Step 6:
Repeat step 4 and step 5 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.
Step 7
For non-FHSS equipment, repeat step 2 to step 6 with the UUT operating at the Highest operating channel on which the blocking test has to be performed (see clause 5.4.11.1).
Step 8
It shall be assessed and recorded in the test report whether the UUT complies with the Receiver Blocking requirement.
Keep the EUT on the lowest and Highest channel working mode.

| | |
|---|---|
| Remark: | If the equipment can be configured to operate with different Nominal Channel Bandwidths (e.g. 20 MHz and 40 MHz) and different data rates, then the combination of the smallest channel bandwidth and the lowest data rate for this channel bandwidth which still allows the equipment to operate as intended shall be used. |
| Test channel: | Lowest channel: (2405MHz), Highest channel: (2480MHz) |

## 7.7.4    TEST RESULTS

Test Date (yy-mm-dd):     2023-01-31~2023-02-21

Test Engineer:              Yang Zhaoyun

Test environment:           Normal condition:

22.5℃/58%RH/101.0kPa

| Receiver Blocking | | | | | | | |
|---|---|---|---|---|---|---|---|
| Receiver Category 2 | | | | | | | |
| Test Mode | Frequency (MHz) | Wanted signal (dBm) | Blocking signal frequency (MHz) | Blocking signal power (dBm) | PER(%) | limit(%) | Test Result |
| Thread | 2405 | -64.87 | 2300 | -33 | 2.90 | 10 | Pass |
| | | | 2380 | | 2.20 | 10 | Pass |
| | 2480 | -64.81 | 2504 | | 0.00 | 10 | Pass |
| | | | 2584 | | 0.00 | 10 | Pass |

Remark: CW=signal power(-34dBm) + Antenna Gain(1dBi).

## APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM

Please refer to the attached document E20230128179401-13- Test Photo.


## APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E20230128179401-14-EUT Photo.


**----------- End of Report -----------**